1: Br Poult Sci 1991 Jul;32(3):565-74

The effects of dietary fat and bird age on the weights of eggs and egg components in the laying hen.

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1. A low-fat diet or an isoenergetic and isonitrogenous high-fat diet containing 55 g maize oil/kg were fed to laying hens at different stages during the laying year in two experiments. 2. Feeding the high-fat diet to young hens resulted in a rapid increase of 2.5 g in egg weight, made up of increases in both yolk and albumen weights. 3. Switching the diets at 50 weeks caused changes in egg weight that were accounted for entirely by changes in egg albumen weight. 4. Feeding the high-fat diet from 46 weeks in a second experiment increased egg and egg albumen weights by 1.26 and 1.34 g respectively. 5. The increase in egg weight with age was associated with a greater increase in the proportion of yolk, at the expense of albumen, compared to egg weight increases related to dietary fat. 6. It is concluded that dietary fatty acids increase egg weight by a mechanism different from that causing age-related increases in weight and that the mechanism involves a stimulation of oviduct protein synthesis.

PMID: 1893267 [PubMed - indexed for MEDLINE]

1: Poult Sci 1995 Jan;74(1):62-74

Further investigations on the effect of dietary manipulations of nutrients on early egg weight.

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Experiments were conducted to determine: 1) whether the beneficial effects of increasing the dietary protein on egg weight during the early stages of egg production is due to a higher intake of methionine or total nitrogen and other essential amino acids; and 2) whether the beneficial effect of supplemental fat on egg weight during the early stages of egg production is due to a higher intake of linoleic acid or the presence of fat per se in the diet. Experiment 1 involved the factorial arrangements of three levels of protein (17, 19, and 21%) and three levels of methionine (.34, .38, and .42%). Experiment 2 involved a control diet with no supplemental fat or with a supplemental level of 2 or 4% of tallow, blended fat, or corn oil. Experiment 3 involved factorial arrangements of two body weight groups (light and heavy), two levels of blended fat (0 and 4%), and two levels of protein (17 and 21%). Pullets were fed the experimental diets from 18 to 38 wk of age in all of the experiments. In Experiment 3, pullets from different regimens were maintained on a 16.5% protein diet up to 62 wk of age. Egg weight responses during the early stages of egg production to increasing the protein or methionine level (Experiment 1) or supplemental sources of fats (Experiment 2) were small and only the methionine effect on egg weight was significant ($P < .05$). In Experiment 3, egg weight during the early stages of egg production was increased due to increasing the protein level or adding fat to the diets ($P < .05$). However, significant interactions were detected between protein and fat for most of the traits. Most traits were increased due to adding 4% fat to high-protein (21%) diets ($P < .05$), but were reduced due to adding 4% fat to low-protein (17%) diets ($P < .05$). Most of the beneficial effects of a high protein level or supplemental fat on early egg weight discontinued upon changing the feeds to a 16.5% protein diet. Egg weight of the heavy-weight groups remained greater than the light-weight groups for the entire experiment ($P < .05$).

Publication Types:
Clinical Trial
Controlled Clinical Trial

PMID: 7899214 [PubMed - indexed for MEDLINE]